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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/556,824	04/21/2000	Hiroyuki Ogawa	SUD-115-USAP	6405

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EXAMINER	
KIM, CHONG R	
ART UNIT	**PAPER NUMBER**
2623	

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/556,824	OGAWA, HIROYUKI	
	Examiner	Art Unit	
	Charles Kim	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-6 and 8-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6 and 8-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 15, 2004 has been entered.

Response to Amendment and Arguments

2. Applicant's amendment filed on May 10, 2004 has been entered and made of record.

3. Applicant's arguments have been fully considered and are addressed in the art rejections below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 11-13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of King et al., U.S. Patent No. 6,122,396 ("King") and Brocklehurst et al., U.S. Patent No. 5,739,003 ("Brocklehurst").

Referring to claim 2, King discloses a method for detecting the presence of colonies of microorganisms in a sample, comprising the steps of:

a. preparing a light-permeable microorganism colony culture medium mixed with a sample (col. 5, lines 24-64. King explains that the microorganisms are culture and then subject to staining. Note that the resultant cultured microorganisms are interpreted as a microorganism colony);

b. pouring the microorganism colony culture mixture into a transparent container cell (col. 6, lines 10-14);

c. illuminating the container cell and medium with a coherent laser beam (col. 6, lines 31-36);

d. receiving the light projection generated by the medium with an image sensor (col. 6, line 31-col. 7, line 17);

e. detecting the presence of colonies of microorganisms by analyzing the projected image data obtained by the image sensor after colonies grow large enough to create shades and the colonies block the laser beam to produce projected image data of the colonies on the image sensor (col. 6, line 31-col. 7, line 17).

King does not explicitly disclose the step of solidifying the microorganism colony culture in the container cell. However, this feature was exceedingly well known in the art. For example, Brocklehurst discloses the steps of preparing a light-permeable microorganism colony culture

medium mixed with a sample, pouring the microorganism colony culture mixture into a transparent container cell, and solidifying the microorganism colony culture in the container cell for imaging purposes (col. 7, lines 35-67).

King and Brocklehurst are combinable because they are both concerned with optically detecting the presence of colonies of microorganisms in a sample. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the microorganism colony culture mixture of King so that it is solidified in the container cell, as taught by Brocklehurst. The suggestion/motivation for doing so would have been to enhance the imaging process of the microorganism colony by providing a pure culture--colonies representing the progeny of a single microbe. Therefore, it would have been obvious to combine King with Brocklehurst to obtain the invention as specified in claim 2.

Referring to claim 11, King further discloses that the presence of microorganisms is detected before colonies overlap each other (col. 9, lines 15-65).

Referring to claim 12, King further discloses the step of detecting a number of colonies to express a level of contamination in a food stuff (col. 9, lines 15-45).

Referring to claim 13, King and Brocklehurst do not explicitly disclose that the image detector has an area greater than one micron in size. However, Official notice is taken that image detectors having an area greater than one micron in size were exceedingly well known in the art. Therefore, it would have been obvious to modify the image detector of King and Brocklehurst so that it has an area greater than one micron in size. The suggestion/motivation for doing so would have been to obtain an accurate image of the microorganism colony.

Referring to claim 15, King and Brocklehurst do not explicitly disclose that the step of staining the colonies is performed with triphenyltetrazolium chloride. However, Official notice is taken that triphenyltetrazolium choride was an exceedingly well known type of staining agent. Therefore, it would have been obvious to modify the staining process of King and Brocklehurst so that it is performed with triphenyltetrazolium chloride. The suggestion/motivation for doing so would have been to obtain a clear image of the microorganism colony.

5. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of King et al., U.S. Patent No. 6,122,396 ("King") and Brocklehurst et al., U.S. Patent No. 5,739,003 ("Brocklehurst"), further in view of Drocourt et al., U.S. Patent No. 5,891,394 ("Drocourt").

Referring to claim 3, King further discloses:

i. a loading portion of a transparent sample containing non-flowing cell container (slide) which contains a microorganism colony under observation (col. 6, lines 11-14);

ii. a coherent laser beam emitting source which illuminates the object placed on the loading portion (col. 6, lines 31-36);

iii. an array of light sensitive detectors (31), arranged to receive the light projection generated by the object illuminated by the laser beam and providing the projected image data corresponding to the received light (col. 6, line 31-col. 7, line 17);

iv. an illumination system which projects light from a laser beam emitting source onto an image sensor (col. 6, lines 31-36).

King and Brocklehurst do not explicitly disclose a beam expander placed between the laser beam emitting source and the loading portion. However, this feature was exceedingly well known in the art. For example, Drocourt discloses an illumination system which projects light from a laser beam emitting source onto an image sensor that includes a beam expander (13) placed between the laser beam emitting source and a microorganism loading portion (col. 10, lines 15-21 and figure 3).

King, Brocklehurst, and Drocourt are combinable because they are all concerned with optically detecting the presence of colonies of microorganisms in a sample. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the illumination system of King and Brocklehurst so that it includes the beam expander of Drocourt. The suggestion/motivation for doing so would have been to provide the capability of controlling the size and direction of the illumination source, thereby enhancing the microorganism imaging process (Drocourt, col. 10, lines 14-21). Therefore, it would have been obvious to combine King and Brocklehurst with Drocourt to obtain the invention as specified in claim 3.

Referring to claim 4, see the rejection of at least claim 3 above. King further discloses:

a. a multiple loading portion capable of accommodating many of the transparent non-flowing cell containers under observation in a row (col. 6, lines 8-28)

b. a coherent laser beam emitting source which illuminates through the transparent non-flowing cell containers placed on the loading portion (col. 6, lines 31-36)

c. an image sensor (31) which is an array of light sensitive detectors, arranged to receive the compounded light projection generated by the transparent non-flowing cell

containers illuminated by the laser beam and providing the projected image data corresponding to the received light (col. 16, lines 10-18).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of King et al., U.S. Patent No. 6,122,396 ("King"), Brocklehurst et al., U.S. Patent No. 5,739,003 ("Brocklehurst"), and Drocourt et al., U.S. Patent No. 5,891,394 ("Drocourt"), further in view of Hirschfeld, U.S. Patent No. 3,819,270 ("Hirschfeld").

Referring to claim 5, the combination of King, Brocklehurst, and Drocourt do not explicitly disclose three coherent laser beam sources and three image sensors.

Hirschfeld discloses three coherent light beam sources which illuminate an object from X, Y, and Z directions which are perpendicular to each other (col. 9, lines 20-25. Note that the "three corresponding light beams along mutually orthogonal paths" in lines 23-24 is interpreted to mean that the beams are in the X, Y, and Z directions that are perpendicular to each other), and three image sensors which are an array of light sensitive detectors, arranged to receive the light projection generated by the object illuminated by the light beams from the X, Y, and Z directions and providing the projected image data corresponding to each detector as X, Y, and Z image data (col. 9, lines 26-38).

King, Brocklehurst, Drocourt, and Hirschfeld are combinable because they are all concerned with imaging systems for detecting microscopic objects. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the imaging system of King, Brocklehurst, and Drocourt so that it includes the teachings of Hirschfeld. The suggestion/motivation for doing so would have been to provide accurate measurements by

minimizing orientation effects, thereby enhancing the imaging process (Hirschfeld, col. 9, lines 11-13). Therefore, it would have been obvious to combine King, Brocklehurst, Drocourt with Hirschfeld to obtain the invention as specified in claim 5.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of King et al., U.S. Patent No. 6,122,396 ("King"), Brocklehurst et al., U.S. Patent No. 5,739,003 ("Brocklehurst"), and Drocourt et al., U.S. Patent No. 5,891,394 ("Drocourt"), in view of Olsztyn et al., U.S. Patent No. 6,002,789 ("Olsztyn"), further in view of Hirschfeld, U.S. Patent No. 3,819,270 ("Hirschfeld").

Referring to claim 6, King, Brocklehurst, and Drocourt disclose a loading portion which holds an object under observation (as noted above), but fail to disclose that the loading portion is capable of rotating the object with a constant angular velocity around a center axis that passes through the center of the object. However, these features were exceedingly well known in the art. For example, Olsztyn discloses a loading portion which holds an object under observation and is capable of rotating the object with a constant angular velocity around a center axis that passes through the center of the object (col. 6, lines 31-40).

King, Brocklehurst, Drocourt, and Olsztyn are combinable because they are all concerned with projection detection systems for detecting microscopic biologic objects. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of King, Brocklehurst, and Drocourt so that the loading portion is capable of rotating an object with constant angular velocity, as taught by Olsztyn. The suggestion/motivation for doing so would have been to provide a microorganism imaging system that produces fast and accurate

measurements (Olsztyn, col. 2, lines 63-67). Therefore, it would have been obvious to combine King, Brocklehurst, and Drocourt with Olsztyn.

King, Brocklehurst, Drocourt, and Olsztyn do not explicitly disclose that the laser beam emitting source illuminates from the direction perpendicular to the axis of rotation.

Hirschfeld discloses three coherent light beam sources which illuminate an object from X, Y, and Z directions which are perpendicular to each other (col. 9, lines 20-25. Note that the "three corresponding light beams along mutually orthogonal paths" in lines 23-24 is interpreted to mean that the beams are in the X, Y, and Z directions that are perpendicular to each other). Note that two of the light sources taught by Hirschfeld will illuminate the object from a direction perpendicular to the axis of rotation. For example, if the axis of rotation was in the X direction, the light sources that illuminate from the Y and Z directions will illuminate the object from a direction perpendicular to the axis of rotation.

King, Brocklehurst, Drocourt, Olsztyn, and Hirschfeld are combinable because they are all concerned with projection detection systems for detecting microscopic biologic objects. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of King, Brocklehurst, Drocourt, and Olsztyn so that the light source illuminates from the direction perpendicular to the axis of rotation, as taught by Hirschfeld. The suggestion/motivation for doing so would have been to provide accurate measurements by minimizing orientation effects, thereby enhancing the imaging process (Hirschfeld, col. 9, lines 11-13). Therefore, it would have been obvious to combine King, Brocklehurst, Drocourt, and Olsztyn with Hirschfeld to obtain the invention as specified in claim 6.

8. Claims 8-10, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of King et al., U.S. Patent No. 6,122,396 ("King") and Brocklehurst et al., U.S. Patent No. 5,739,003 ("Brocklehurst"), further in view of Olsztyn et al., U.S. Patent No. 6,002,789 ("Olsztyn").

Referring to claim 8, King and Brocklehurst do not explicitly disclose that the container cell is cylindrical. However, this feature was exceedingly well known in the art. For example, Olsztyn discloses a container cell (12) for holding a microorganism colony that is cylindrical (col. 3, lines 10-50 and figure 1).

King, Brocklehurst, and Olsztyn are combinable because they are all concerned with imaging systems for detecting microorganisms. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the container cell of King and Brocklehurst so that it is cylindrical, as taught by Olsztyn. The suggestion/motivation for doing so would have been to enhance the flexibility of the imaging system by providing the capability of utilizing a variety of different types of container cells. Therefore, it would have been obvious to combine King and Brocklehurst with Olsztyn to obtain the invention as specified in claim 8.

Referring to claim 9, see the discussion of at least claim 6 above. Olsztyn further discloses the step of rotating a container cell with constant angular velocity around a center axis that passes through the center of the object (col. 6, lines 31-40).

Referring to claim 10, King and Brocklehurst do not explicitly disclose that the container cell is rotated about an axis that passes through a center of the container cell when illuminated with the laser beam. However, this feature was exceedingly well known in the art. For example,

Olsztyn discloses a container cell that is rotated about an axis that passes through a center of the container cell when illuminated with a laser beam (col. 3, lines 10-50 and col. 6, lines 31-40).

King, Brocklehurst, and Olsztyn are combinable because they are all concerned with imaging systems for detecting microorganisms. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of King and Brocklehurst so that it is capable of rotating the container cell about an axis that passes through a center of the container cell when illuminated with the laser beam, as taught by Olsztyn. The suggestion/motivation for doing so would have been to provide a microorganism imaging system that produces fast and accurate measurements (Olsztyn, col. 2, lines 63-67). Therefore, it would have been obvious to combine King and Brocklehurst with Olsztyn to obtain the invention as specified in claim 10.

Referring to claim 14, King and Brocklehurst do not explicitly disclose the step of detecting all microorganism colonies in the path of the laser beam regardless of depth of location by projecting a colony image directly onto the image sensor. However, these features were exceedingly well known in the art. For example, Olsztyn discloses the step of detecting all microorganism colonies in a path of a laser beam regardless of depth of location by projecting a colony image directly onto an image sensor (figure 1).

King, Brocklehurst, and Olsztyn are combinable because they are all concerned with imaging systems for detecting microorganisms. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the imaging system of King and Brocklehurst to include the teachings of Olsztyn. The suggestion/motivation for doing so would have been to provide a microorganism imaging system that produces fast and accurate

measurements (Olsztyn, col. 2, lines 63-67). Therefore, it would have been obvious to combine King and Brocklehurst with Olsztyn to obtain the invention as specified in claim 14.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of King et al., U.S. Patent No. 6,122,396 ("King") and Brocklehurst et al., U.S. Patent No. 5,739,003 ("Brocklehurst"), in view of Drocourt et al., U.S. Patent No. 5,891,394 ("Drocourt"), further in view of Tanaka, U.S. Patent No. 6,538,819 ("Tanaka").

Referring to claim 16, King, Brocklehurst, and Drocourt do not explicitly disclose that the beam expander consists of a concave lens and a convex lens. However, beam expanders consisting of a concave lens and a convex lens were exceedingly well known in the art. For example, Tanaka discloses a beam expander that consists of a concave lens and a convex lens (figure 1A).

King, Brocklehurst, Drocourt, and Tanaka are combinable because they are all concerned with laser imaging systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the beam expander of King, Brocklehurst, and Drocourt so that it consists of a concave lens and a convex lens, as taught by Tanaka. The suggestion/motivation for doing so would have been to provide a beam expander that has a short length for a given magnification, thereby providing a clear picture. Therefore, it would have been obvious to combine King, Brocklehurst, and Drocourt with Tanaka to obtain the invention as specified in claim 16.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck
December 23, 2004

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